TRTLIGHTING

ROAD TUNNEL LIGHTING

SAFE & EFFICIENT ILLUMINATION FOR EVERY JOURNEY

QUALITY & EXPERIENCE

TRT Lighting Ltd (Thorlux Road and Tunnel Lighting) is one of ten companies within the FW Thorpe Group.

The names Thorlux and FW Thorpe Plc are globally recognised for their commitment to quality, supported by a strong UK export customer base and international representation. The Group supplies luminaires and control systems to over 60 countries worldwide

Building on more than 85 years of experience, and continuing the desire to embrace new technologies, TRT Lighting evolved from Thorlux in 2012 as the specific road and tunnel lighting specialist division of the Group.

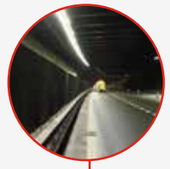
TRT designs, manufactures and supplies sustainable and environmentally friendly performance lighting products with a core focus on providing reliable, energy efficient and user-friendly luminaires for road tunnel applications.

Extensive product development and factory testing ensures that even the most demanding project specifications are met. Working closely with consultants and contractors has enabled TRT to design and supply luminaires and associated control systems to the highest performance and quality standards required for the rigorous demands of road tunnel environments.

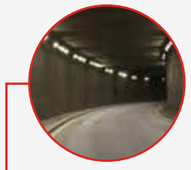
Bespoke installation solutions have been adopted on many projects providing the contractor with installation time saving benefits. Flexible mounting brackets, “plug and play” mains and data leads can all be provided to suit any given specification.

With hundreds of thousands of luminaires now installed across the UK road network and a portfolio of fully automated tunnel lighting systems, TRT has expanded its export horizons and is now represented worldwide to meet international needs.

Founder, Frederick W Thorpe with coworkers circa 1940

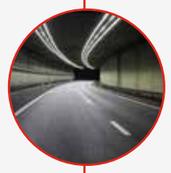


CHESLYN HAY, CANNOCK
M6 TOLL TUNNEL
200 LUMINAIRES



DONCESTER
DONCASTER TUNNEL
261 LUMINAIRES

LONDON
HANGER LANE TUNNEL
496 LUMINAIRES

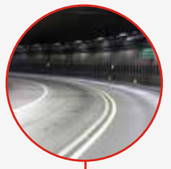


LONDON
M20/M25 TUNNEL
125 LUMINAIRES

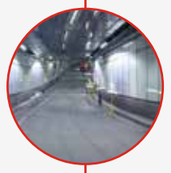
LONDON
HEATHROW MAIN TUNNELS
840 LUMINAIRES

LONDON
HEATHROW SIDE TUNNELS
492 LUMINAIRES

LONDON
HEATHROW CARGO TUNNEL
354 LUMINAIRES



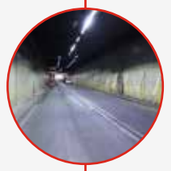
LONDON
EASTWAY TUNNEL
250 LUMINAIRES



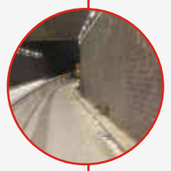
LONDON
THE STRAND TUNNEL
366 LUMINAIRES

LONDON
HOLMESDALE TUNNEL
2646 LUMINAIRES

LONDON
FORE STREET TUNNEL
792 LUMINAIRES



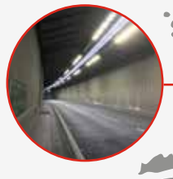
LONDON
PICCADILLY TUNNEL
300 LUMINAIRES



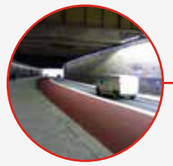
LONDON
HARROW ROAD TUNNEL
66 LUMINAIRES

LONDON
SILVERTOWN TUNNEL
1110 LUMINAIRES

COLWYN BAY
COLWYN BAY UNDERPASS
90 LUMINAIRES

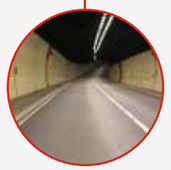


CONWY
CONWAY RETROFIT WESTBOUND TUNNEL
1082 LUMINAIRES



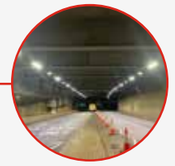
BRISTOL
CATTLE MARKET ROAD TUNNEL
97 LUMINAIRES

LEWES
CUILFAIL TUNNEL
310 LUMINAIRES



HINDHEAD
HINDHEAD TUNNEL
1849 LUMINAIRES

THANET, KENT
CLIFFSEND UNDERPASS
202 LUMINAIRES



KINGSTON-UPON-THAMES
HORSEFAIR UNDERPASS
42 LUMINAIRES

UK

LONDON

KEY REQUIREMENTS

- DRIVER COMFORT
- SYSTEM LONGEVITY
- REDUCED MAINTENANCE
- SAFETY
- SIMPLE INSTALLATION
- RELIABILITY
- VISUAL GUIDANCE
- LIGHTING CONTROL
- RUNNING COST SAVINGS
- QUALITY
- REDUCED CARBON

The safety of road tunnel users is paramount; traffic needs to enter, pass through and exit without any adverse effects to driving characteristics.

At any time of the day or night, the transition from the open road into a tunnel can present an increase in accident potential if the lighting is not correctly designed. Whilst there are many different design approaches, they are all intended to create the correct visual environment for any type of road or user irrespective of the external ambient conditions.

Gonio-Photometer

All luminaires are electrically tested on dedicated assembly test benches in line with the requirements of BS EN 60598-1.

PRODUCT TESTING

Rigorous product testing is essential in maintaining a reputation for reliability and quality.

All luminaires provided by TRT are tested in its state-of-the-art gonio-photometry lab which is accredited by the LIA in accordance with its TSD-003 gonio-photometry scheme.

The laboratory enables TRT to obtain the best optical performance from its luminaires.

In the photometric test laboratory, a sophisticated goniophotometer gives fast and reliable measurements of the luminaire's light distribution. An integrating sphere equipped with spectral analyser accurately measures light quality, efficiency and colour temperature so customers can rest assured that photometric data provided is accurate. Photometry measurements can also be witnessed as part of the Factory Acceptance Testing.

All luminaires are electrically tested on dedicated assembly test benches in line with the requirements of BS EN 60598-1. Visual inspections, 100% functional testing and any programming are added on top of these requirements.

Other testing covers environmental and electrical parameters including extreme ambient temperatures, vibration testing, dust/water ingress, electromagnetic compatibility and current harmonics, in accordance with relevant European standards.

All test equipment is subject to regular in-house maintenance and calibration, with external third-party calibration at regular intervals to ensure accuracy of data.

LIA LAB CERTIFICATION
003-0005

CONSTRUCTION

HOUSING FOR ARDUOUS CONDITIONS

The luminaire design consists of high quality extruded 6063T6 aluminium housing, embracing the quality and construction features required for such applications.

LED TECHNOLOGY

TRT's comprehensive range of road tunnel luminaires embraces the features, advantages and benefits of LEDs.

Precisely controlled and varied optical distributions now allow the tunnel designer to create an enhanced visual scene within a road tunnel environment whilst also increasing the road user comfort, safety and visual guidance throughout the length of the tunnel. LEDs covering all colour temperatures with a high CRI provide increased clarity of colour and detail reducing the perception of being "enclosed" within a tunnel.

REDUCED LUMINAIRE WEIGHT = REDUCED SUPPORT STRUCTURE COST

Using aluminium extrusion minimises the weight of the tunnel luminaire.

TUNNEL LUMINAIRES ARE REGULARLY WASHED DOWN

Each luminaire will need to be regularly cleaned. The smooth toughened front safety glass cover ensures that there are no awkward lenses requiring localised attention to cleaning.

SMOOTH EXTERNAL SURFACES

Tunnel luminaires are prone to collecting dirt and moisture. Designed with smooth external surfaces the negative effects on light output and efficiency is minimised.

MINIMAL PLASTIC MATERIALS

As polymers degrade in tunnel environments, a minimum of plastic materials are used to increase installation longevity.

TUNNEL LUMINAIRES ARE EXPECTED TO LAST OVER 25 YEARS

TRT tunnel luminaires are IK09 and IP66 rated and will be resistant over time to dirt, dust, moisture, impact, UV, heat, cold and pressure.

AVOIDING ELECTROLYTIC CORROSION IS PARAMOUNT

Clamp brackets are available in any grade of stainless steel and are speifically designed to suit a given installation. Essential measures are taken to isolate when dissimilar metals are present.

LED TECHNOLOGY

Linear lighting arrays of continuous LEDs achieve excellent carriageway and wall uniformities whilst also significantly reducing the Threshold Increment (TI) of each lighting zone compared with other lighting approaches.

The ability to direct light only where it is needed also provides the end user with significant through life savings as power consumption can be reduced.

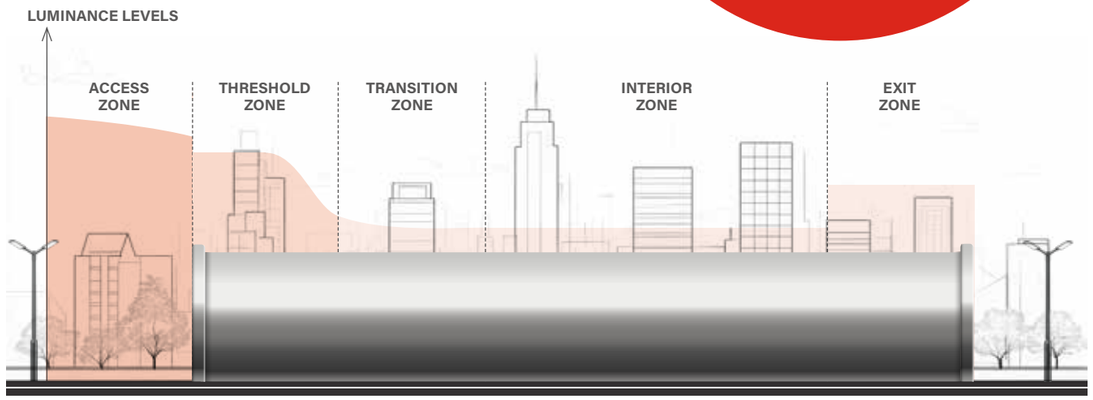
ACCESS ZONE
The section of the road leading up to the tunnel entrance.

THRESHOLD ZONE
The first part of the enclosed tunnel, immediately after the entrance.

TRANSITION ZONE
The zone following the threshold zone, where light levels are gradually reduced.

INTERIOR ZONE
The longest part of the tunnel, typically in the middle.

EXIT ZONE
The final zone before leaving tunnel.



A placement speed of up to 45,000 components per hour provides a quick PCB sampling turnaround.

Since its installation in 2017, a dedicated clean room has been operating on-site, housing an SMT production line. This facility manufactures all LED PCBs and control PCBs used in TRT products, granting the company total control over the placement of LEDs on specifically designed boards. This capability allows designs to be tailored for any type of tunnel whether it is a long high speed motorway tunnel or short trunk road underpass.

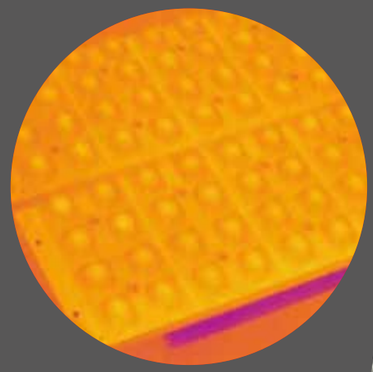
LED THERMAL MANAGEMENT

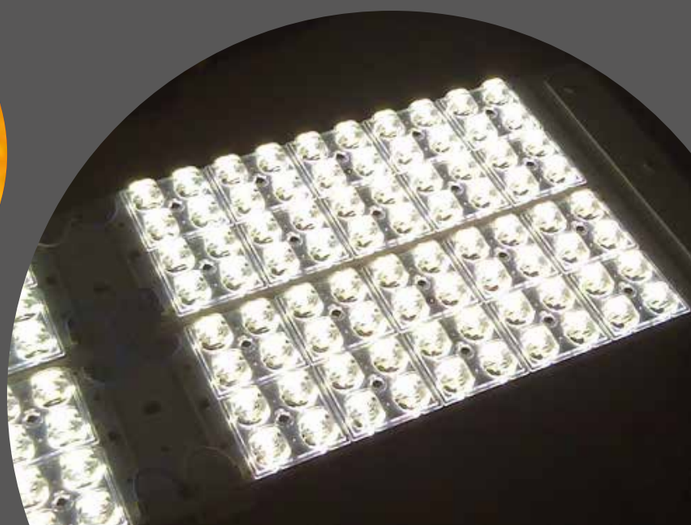
Careful consideration has been given to not only the placement and distribution of the LEDs but equally to their operating temperatures.

The extruded aluminium body of TRT tunnel luminaires lends itself perfectly to act as the "heat sink" for the LEDs ensuring that maximum possible lifetimes are achieved. The added benefits of low ambient temperatures in tunnels and the ability to dim the light output also contribute significantly to increased lifetime.

Testing has allowed TRT to forecast tunnel LED lifetimes in excess of 100,000hrs providing a very low maintenance lighting solution.

When technology improves, the efficiency of LEDs will further increase thus requiring less LEDs for the same effective lighting levels whilst reducing heat and therefore providing even longer predicted lifetimes.





OPERATION & EFFICIENCY OF THE LED LIGHT SOURCES

- **The less light that is internally reflected or refracted, the higher the efficiency of the luminaire**

By utilising a 'Primary LED Optic' with designated roadway distribution, maximum performance is achieved with minimal power.

- **The cooler the LED's junction temperature the higher the light output of the LED**

In addition to the dedicated LED boards and internal aluminium heat sink, the whole aluminium body of the luminaire also increases the dissipation of heat.

- **The LEDs are dimmable down to 10% further reducing the LED's junction temperature**

Proven in multiple historic TRT installations, dimming of light sources extends life and significantly reduces running costs.

- **The LEDs provide consistent colour appearance and rendering properties**

TRT Lighting only specifies its tunnel LEDs from two adjacent dedicated "bins" according to the ANSI binning references to ensure LED colour stability.

- **Designing a specific optic for a specific tunnel reduces power consumption**

The ability to "in house" manufacture each LED board provides TRT with the complete flexibility to control the number and distribution of the required LEDs.

- **LEDs can fail**

TRT design all of its functional general lighting LED based products to incorporate protective LED devices ensuring that any individual LED failure does not affect other LEDs in the circuit.

LED PROTECT & LUX GUARD

LED SYSTEM PROTECTION

LEDs are a very efficient light source and are resilient to many conditions that can be detrimental to the lifetime of traditional lamps.

For example, LEDs are largely unaffected by frequent switching, shock or vibration. However, LEDs or their solder joints can infrequently fail. In such circumstances it would be inconvenient if the failure caused significant loss of light, or if the luminaire extinguished completely.

In many luminaires, LEDs are linked in series whereby a current flows through each LED in turn. Should an LED or solder joint fail, a whole row of LEDs, or in fact all LEDs may extinguish. TRT has designed specific protective measures to prevent such a condition.

TRT offer two methods of LED protection:

LED PROTECT

is revolutionary circuit design that can be specified on all TRT luminaires that use high power LEDs, for example the X-r` nage Boost tunnel luminaire. In this type of luminaire LEDs are connected in a series string and failure of an LED or its solder joint can cause an open circuit and all LEDs in the string to extinguish. To overcome this, TRT adds PLED protectors to all of its high power tunnel luminaires.

PLED protectors provide an electronic alternative path for the current to flow in the event of LED or solder joint failure ensuring all remaining LEDs stay illuminated at the correct power. This is an invaluable feature guaranteeing that a luminaire continues to provide light, even in the case of nuisance LED failures, and reduces the maintenance costs of a project.

1 LED PROTECT
For high power LEDs

LED PROTECT

LUX GUARD

by TRT is a patented current sharing PCB and circuit design philosophy. If an LED fails then its current is shared via neighbouring circuits, with each LED's brightness increasing slightly to compensate.

LUX GUARD ensures that a luminaire continues to provide its designed lumen performance, even in the case of nuisance LED failures, and reduces the maintenance costs of a project.

2 LED GUARD
For medium power LEDs

LUX GUARD

SERVICES
TRT OFFER...

COST MODELLING

Total through life costing models can be generated by TRT which allows the customer to evaluate each project in terms of the design criteria, luminaire choice, performance and the associated on-going running and maintenance costs. Graphical analysis and comparison tables provide a quick reference for the choices available in a project. TRT can then tailor variables to create a realistic total cost of ownership specific to each tunnel project.

LIGHTING DESIGN & PRODUCTS

The TRT tunnel team has an intrinsic knowledge and as such will be able to confidently deliver a superior solution with minimal downtime of the tunnel operation.

Providing a fully compliant lighting design solution is of course the number one goal, although ease of installation will also be a key consideration, as minimal refurb time will keep the overall project costs within budget.

All initial testing will be conducted at the manufacturing premises in Redditch, Worcestershire and all lighting units will be delivered to site fully functioning, programmed and labelled according to the specific installation location within the tunnel.

SITE SUPPORT

'TRT engineers will be on-site to offer guidance at the point of the first luminaires installation and can be called out to attend site at any stage of the project. They will also remain contactable for technical support throughout the remainder of the works.

Images depict the real life and pseudo image of luminance values, produced during the SAT testing, and used to verify all lighting values and uniformity. Lighting equipment is calibrated, and copies of relevant calibration certificates will be available on site and within the full SAT report.

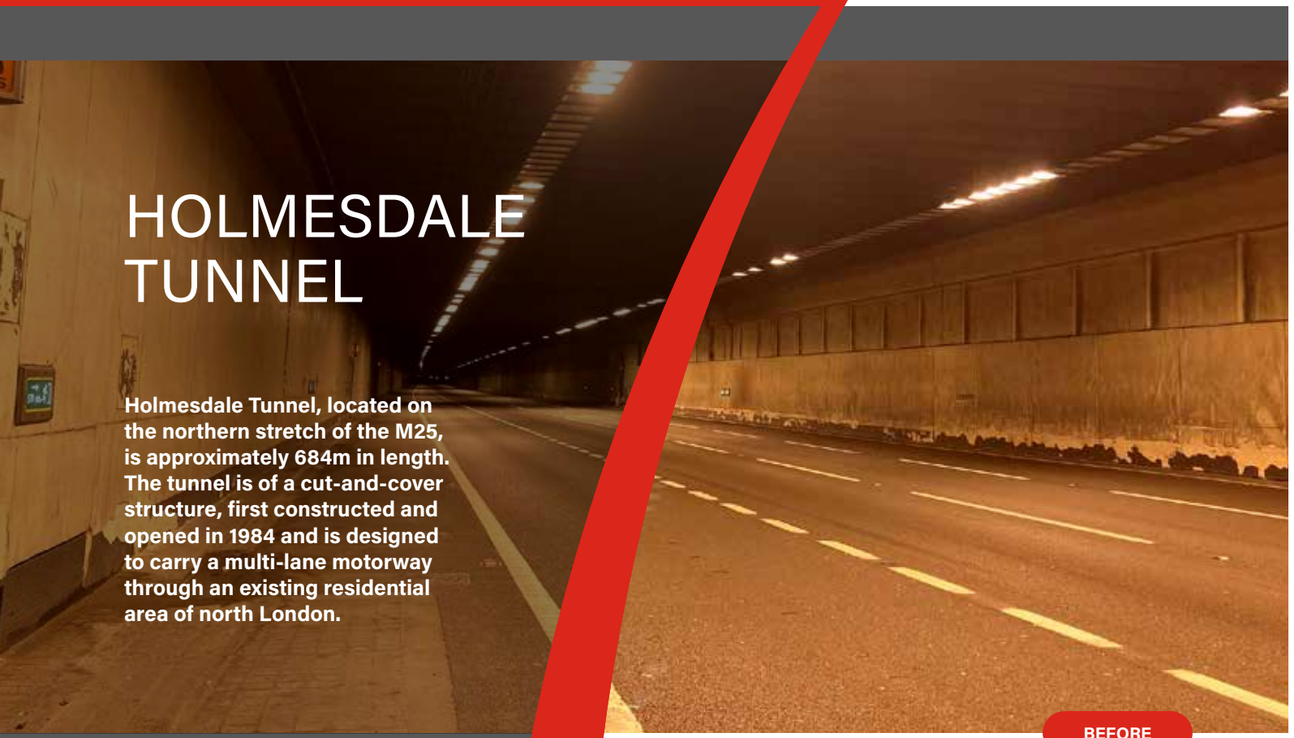
SAT & COMMISSIONING

Commissioning and onsite support is in included i.e. there are no hidden extra TRT costs. Following the successful installation by an appointed contractor, TRT engineers will ensure all luminaires are operating correctly and responding to control system demands, plus the rectification of any faults – the attendance of a controls engineer is critical at this point.

Following commissioning, SAT (site acceptance tests) will be performed, completed in line with the BS 5489-2:2016 guidance. The equipment used to measure luminance values is a calibrated digital camera with associated tunnel lighting specific software. Images depict the real life and pseudo image of luminance values, produced during the SAT testing, and used to verify all lighting values and uniformity. Lighting equipment is calibrated, and copies of relevant calibration certificates will be available on site and within the full SAT report.

DELIVERY AND VESTING OPTIONS

Once an order is received, TRT will schedule the manufacturing of the finished products to deliver the project on or in advance of required on-site delivery date. Should initial dates change due to any unforeseen circumstances with tunnel access / project start date, TRT can "vest" the entire consignment within its premises up to a pre-agreed date. This facility is offered to the client as a free of charge service with both parties formally engaging in a vesting agreement. All goods will be made available for client inspection at any point during the vesting process and will be fully covered under the TRT insurance policies thus negating any potential price increases because of factors out of the client's control. Should the vesting period extend beyond the agreed date charges will apply.



HOLMESDALE TUNNEL

Holmesdale Tunnel, located on the northern stretch of the M25, is approximately 684m in length. The tunnel is of a cut-and-cover structure, first constructed and opened in 1984 and is designed to carry a multi-lane motorway through an existing residential area of north London.

PROJECT OVERVIEW

The original lighting installation was first refurbished in 2010, some 26 years after the original opening of the tunnel and, at the time, LED lighting technology for this type of application was in its infancy and not considered viable.

As a result, the 2010 refurbishment featured high-pressure sodium lamps and control gear for all lighting levels with the varying demands for the daytime boost lighting being accommodated by switching lamps on and off in stages.

BEFORE

Since the first refurbishment, advances in LED technology have, of course, experienced an exponential rise in terms of significant improvements in thermal management and increases in luminous flux.

These advancements meant that a further refurbishment was felt viable, even though the tunnel was only 12 years into the projected lifetime of the previously refurbished system.

It was recognised that switching to LED could bring with it significant commercial and operational benefits, which could be realised immediately.

"A great project to be involved in, working alongside our partners TRT & Balfour Beatty Kilpatrick to provide an innovative solution which not only gave our client substantial energy savings but also enabled the reuse of existing infrastructure. With close collaboration between our engineering teams, technical issues were overcome and despite several unexpected challenges, the project was a great success. Well done to everyone involved."

Tim Whiteley Senior Solutions Manager, PDS Infrastructure Systems

PROJECT SOLUTION

In January 2021, TRT was appointed by PDS in collaboration with Balfour Beatty Kilpatrick to develop a new, LED retrofit solution, which was designed to replace the high-pressure sodium lamp-and-gear combination within the existing competitor luminaire carcasses, which were deemed mechanically sound and still fit for purpose.

The project, which was completed over a duration of 11 months, allowed for an easy conversion to a modern and highly efficient LED solution without the excessive and sometimes prohibitive expense of a complete refit.

The LED technology used in the retrofit units was rigorously tested within the LIA accredited laboratory to ensure that, prior to overall installation commencing, the thermal operation of the electronics, the photometric performance enabling delivery of light to the road and wall surfaces, and the efficacy and projected lifetime requirements all achieved the best possible results.

All testing was conducted with the complete system mounted inside the existing luminaire housing currently installed within the tunnel.

From an operational perspective, all the 2,600+ retrofit LED trays and light engines were integrated with, and controlled by, a new PDS Scanlight Eco+ lighting control system, so allowing the multiple light levels in the tunnel to exactly match the required lumen delivery demand.

During daytime, when light demand in a tunnel is at its highest, all LED light engines remain illuminated in their 'boost' mode and dimmed to the exact level to accurately match the luminance level required.

This provides excellent uniformity levels across the carriageway while also negating the large inrush currents on the electrical network, which are prevalent with traditional switch-staged tunnel lighting systems.

COMPARING PERFORMANCE

When comparing the before and after LED refurbishment scenario, based on a like-for-like operational cycle throughout the year, the annual energy savings and, of course, CO_2 reductions are projected to save more than 60% of the high-pressure sodium system previously in operation.

Prior to the global energy price increases this presented a payback against the lighting system capital outlay of fewer than three years.

In addition to the energy and environmental saving achievements of the LED retrofit, the physical elements of prolonging the operational lifetime of the lighting system and significantly reducing the maintenance cost cannot be ignored.

This includes all the operational and cost benefits this refurbishment has achieved. For example, reutilising the existing luminaire housings was a significant factor during the whole process, ensuring that the waste element of the project was reduced to just the correct disposal method of the redundant lamps and control gear components.

We all understand that switching to LED and prioritising circular economy approaches are not by themselves going to solve either the current energy crisis or climate change. But they can, and do, help.

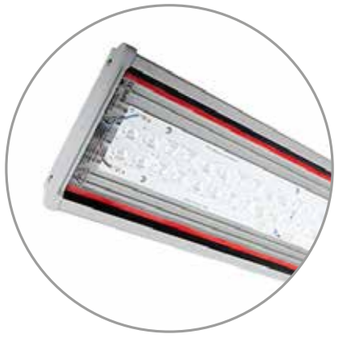
This project shows that, even in a challenging lighting environment such as tunnels, it is eminently possible to successfully deliver a lighting system that embraces the circular economy '3Rs' of reuse, repurpose and renew.

AFTER

PRODUCT KNOWLEDGE & GENERIC RANGE

By appointment, customers can schedule hands-on tunnel lighting demonstrations, either through the TRT demonstration van or by visiting the company's showroom. In addition, visitors have the option to arrange a guided tour of TRT's UK-based manufacturing facility in Redditch, which holds ISO 9001, ISO 14001, and ISO 45001 certifications.

Reflecting a strong commitment to British manufacturing, the factory tour offers an in-depth look at the production process behind TRT luminaires — including environmentally friendly powder coating operations and the SMT Clean Room.



X-RANGE INTERIOR

X-RANGE BOOST

X-RANGE TWIN BOOST

I-RANGE

RETROFIT

RETROFIT

In today's world, sustainability is no longer just about energy savings—it's about rethinking how we use resources to build a better, long-lasting future.

Capital costs, circularity, and sustainability must go hand in hand, especially in industries like lighting, where the right solutions can make a tangible difference. TRT Lighting has embraced this challenge through innovative LED refurbishment projects, demonstrating that upgrading to energy-efficient solutions doesn't have to mean complete replacements.

By designing LED geartrays to fit into existing luminaire carcasses, TRT has helped reduce the capital costs of new lanterns while also making installations easier and more cost-effective. This approach has been successfully applied in major projects, including the refurbishment of the Holmesdale Tunnel and Heathrow Airport's tunnel network, where over 4,000 sodium lamps were replaced with LEDs without discarding functional luminaires.

While switching to LED and embracing circular economy principles will not solve the energy crisis or climate change alone, they play a vital role in reducing waste, lowering costs, and improving efficiency.

X-RANGE
INTERIOR

SPECIFICATION

- ✓ LED colour temperature 4000K (alternatives available)
- ✓ Colour rendering index >70
- ✓ Projected L90 after 100,000 hours
- ✓ Power factor 0.95 at full load
- ✓ Lightweight low profile luminaire
- ✓ High quality extruded 6063T6 aluminium housing
- ✓ Toughened flat safety glass cover
- ✓ Dedicated optical assemblies
- ✓ Wide variety of optical distributions
- ✓ Lux Guard (patent granted) - Innovative LED current sharing PCB design that maintains light output in the event of LED failure(s)
- ✓ Dim level 10-100%
- ✓ DALI/1-10V
- ✓ Remote or integral driver enclosures
- ✓ Optional surge protection 10kV/10kA
- ✓ Total galvanic isolation from mounting structure
- ✓ Rear or end entry connections for housing
- ✓ IP68 in-line connectors
- ✓ LSF0H and fire resistant cable options
- ✓ Dedicated clamp brackets

IP66
Ingress Protection

IK09
Impact Resistance

13kg Weight

Driver Enclosure
Electrical Class 1

Luminaire
Electrical Class 2

-20 to +35°C Ambient

LED Light Source

RANGE OVERVIEW								
Type	System Power	Symmetric Optics	Point Source Optics	Counter Beam Optics	Cornice Optics	CCT	Lumen Output	CRI
XRA-I-4	25W	✓	✓	✓	✓	4000K	Up to 4,083lm	>70
XRA-I-7	40W	✓	✓	✓	✓	4000K	Up to 7,040lm	>70

ELECTRICAL CHARACTERISTICS	XRA-I-4	XRA-I-7
System Power	25W	40W
LED CCT	4000K	
LED CRI	>70	
Lumen Output	Up to 4,083lm	Up to 7,040lm
Lumen Maintenance	Projected L90 after 100,000 hours	
Driver Current	920mA	800mA
Driver Output	Constant current output with AM dimming	
Power Factor (Full Load/Half Load)	0.95/0.90	
Operational Voltage	220-240VAC rms	
Operating Frequency	50/60Hz	
Driver Quantity per Luminaire	1	
Inrush Current (Apk/50%-µS)	21A/300µS	
Running Current (Max)	110mA	180mA
Surge Protection (COM/DIF)	10kV/6kV	
Additional Surge Protection (on request)	10kV/10kA	
Dimming Protocols	DALI/1-10V	
Dim Level	10-100%	
Max. Driver Qty on MCB 16A Type C	35	
Insulation Class	Class II (luminaire) Class I (driver enclosure)	
Connections	Driver to luminaire LSF0H or fireproof cable supplied with IP68 in-line connectors	

MECHANICAL CHARACTERISTICS	
Housing Material	Extruded aluminium 6063T6
Housing Finish	Silver anodised AA25
Cover Material	Toughened flat safety glass
Lens Material	PMMA
Clamp Material	Stainless steel 316
Clamp Insulator Material	Nylon 66
Clamp Finish	Nylon 11 coated
Ingress Protection Rating	IP66
Weight	13kg (add 0.8kg for fixing kit)
Impact Resistance Rating	IK09
Mounting Methods	Surface mounted

X-RANGE
BOOST

SPECIFICATION

- ✓ LED colour temperature 4000K (alternatives available)
- ✓ Colour rendering index >70
- ✓ Projected L90 after 100,000 hours
- ✓ Power factor 0.95 at full load
- ✓ Lightweight low profile luminaire
- ✓ High quality extruded 6063T6 aluminium housing
- ✓ Toughened flat safety glass cover
- ✓ Dedicated optical assemblies
- ✓ Wide variety of optical distributions
- ✓ Dim level 10-100%
- ✓ DALI/1-10V
- ✓ Remote or integral driver enclosures
- ✓ Optional surge protection 10kV/10kA
- ✓ Total galvanic isolation from mounting structure
- ✓ Rear or end entry connections for housing
- ✓ IP68 in-line connectors
- ✓ LSF0H and fire resistant cable options
- ✓ Dedicated clamp brackets

IP66
Ingress Protection

IK09
Impact Resistance

2.0-10.8kg Weight

Driver Enclosure
Electrical Class 1

Electrical Class 2

-20 to +35°C Ambient

LED Light Source

RANGE OVERVIEW

Type	System Power	Symmetric Optics	Point Source Optics	Counter Beam Optics	Cornice Optics	CCT	Lumen Output	CRI
XRA-B-1	69W	✓	✓	✓	✓	4000K	Up to 10,151lm	>70
XRA-B-2	138W	✓	✓	✓	✓	4000K	Up to 20,302lm	>70
XRA-B-3	207W	✓	✓	✓	✓	4000K	Up to 30,454lm	>70
XRA-B-4	276W	✓	✓	✓	✓	4000K	Up to 40,605lm	>70
XRA-B-5	296W	✓	✓	✓	✓	4000K	Up to 44,564lm	>70
XRA-B-6	355W	✓	✓	✓	✓	4000K	Up to 53,477lm	>70

ELECTRICAL CHARACTERISTICS	XRA-B-1	XRA-B-2	XRA-B-3	XRA-B-4	XRA-B-5	XRA-B-6
System Power	69W	138W	207W	276W	296W	355W
LED CCT	4000K					
LED CRI	>70					
Lumen Output	Up to 10,151lm	Up to 20,302lm	Up to 30,454lm	Up to 40,605lm	Up to 44,564lm	Up to 53,477lm
Lumen Maintenance	Projected L90 after 100,000 hours					
Driver Current	700mA				600mA	
Driver Output	Constant current output with AM dimming					
Power Factor (Full Load/Half Load)	0.95/0.90					
Operational Voltage	220-240VAC rms					
Operating Frequency	50/60Hz					
Driver Quantity per Luminaire	1					
Inrush Current (Apk/50%-µS)	43A/260µS	58A/340µS	80A/225µS	13A/1320µS	13A/1320µS	13A/1320µS
Running Current (Max)	290mA	290mA	870mA	1,200mA	1,230mA	1,480mA
Surge Protection (COM/DIF)	10kV/6kV					
Additional Surge Protection (on request)	10kV/10kA					
Dimming Protocols	DALI/1-10V					
Dim Level	10-100%					
Max. Driver Qty on MCB 16A Type C	17	11	13	11	13	13
Insulation Class	Class II (Luminaire) Class I (Driver enclosure)					
Connections	Driver to luminaire LSF0H or fireproof cable supplied with IP68 in-line connectors					

MECHANICAL CHARACTERISTICS	
Housing Material	Extruded aluminium 6063T6
Housing Finish	Silver anodised AA25
Cover Material	Toughened flat safety glass
Lens Material	PMMA
Clamp Material	Stainless steel 316
Clamp Insulator Material	Nylon 66
Clamp Finish	Nylon 11 coated
Ingress Protection Rating	IP66
Weight	2.0-10.8kg (add 0.8kg for fixing kit)
Impact Resistance Rating	IK09
Mounting Methods	Surface mounted

X-RANGE
TWIN BOOST

SPECIFICATION

- ✓ LED colour temperature 4000K (alternatives available)
- ✓ Colour rendering index >70
- ✓ Projected L90 after 100,000 hours
- ✓ Power factor 0.95 at full load
- ✓ Lightweight low profile luminaire
- ✓ High quality extruded 6063T6 aluminium housing
- ✓ Toughened flat safety glass cover
- ✓ Dedicated optical assemblies
- ✓ Wide variety of optical distributions
- ✓ Dim level 10-100%
- ✓ DALI/1-10V
- ✓ Remote or integral driver enclosures
- ✓ Optional surge protection 10kV/10kA
- ✓ Total galvanic isolation from mounting structure
- ✓ Rear or end entry connections for housing
- ✓ IP68 in-line connectors
- ✓ LSF0H and fire resistant cable options
- ✓ Dedicated clamp brackets

IP66
Ingress Protection

IK09
Impact Resistance

3.6-19.8kg Weight

Driver Enclosure
Electrical Class 1

Luminaire
Electrical Class 2

-20 to +35°C Ambient

LED Light Source

RANGE OVERVIEW

Type	System Power	Symmetric Optics	Point Source Optics	Counter Beam Optics	Cornice Optics	CCT	Lumen Output	CRI
XRA-T-2	138W	✓	✓	✓	✓	4000K	Up to 20,302lm	>70
XRA-T-4	276W	✓	✓	✓	✓	4000K	Up to 40,605lm	>70
XRA-T-6	414W	✓	✓	✓	✓	4000K	Up to 60,908lm	>70
XRA-T-8	552W	✓	✓	✓	✓	4000K	Up to 81,211lm	>70
XRA-T-10	591W	✓	✓	✓	✓	4000K	Up to 89,129lm	>70
XRA-T-12	710W	✓	✓	✓	✓	4000K	Up to 106,955lm	>70

ELECTRICAL CHARACTERISTICS	XRA-T-2	XRA-T-4	XRA-T-6	XRA-T-8	XRA-T-10	XRA-T-12
System Power	138W	276W	414W	552W	591W	710W
LED CCT	4000K					
LED CRI	>70					
Lumen Output	Up to 20,302lm	Up to 40,605lm	Up to 60,908lm	Up to 81,211lm	Up to 89,129lm	Up to 106,955lm
Lumen Maintenance	Projected L90 after 100,000 hours					
Driver Current	700mA				600mA	
Driver Output	Constant current output with AM dimming					
Power Factor (Full Load/Half Load)	0.95/0.90					
Operational Voltage	220-240VAC rms					
Operating Frequency	50/60Hz					
Driver Quantity per Luminaire	1	1	2	2	2	2
Inrush Current (Apk/50%-µS)	58A/340µS	13A/1320µS	80A/225µS	13A/1320µS	13A/1320µS	13A/1320µS
Running Current (Max)	580mA	1,200mA	1,800mA	2,300mA	2,900mA	3,500mA
Surge Protection (COM/DIF)	10kV/6kV					
Additional Surge Protection (on request)	10kV/10kA					
Dimming Protocols	DALI/1-10V					
Dim Level	10-100%					
Max. Driver Qty on MCB 16A Type C	11	11	13	11	11	11
Insulation Class	Class II (luminaire) Class I (driver enclosure)					
Connections	Driver to luminaire LSF0H or fireproof cable supplied with IP68 in-line connectors					

MECHANICAL CHARACTERISTICS	
Housing Material	Extruded aluminium 6063T6
Housing Finish	Silver anodised AA25
Cover Material	Toughened flat safety glass
Lens Material	PMMA
Clamp Material	Stainless steel 316
Clamp Insulator Material	Nylon 66
Clamp Finish	Nylon 11 coated
Ingress Protection Rating	IP66
Weight	3.6-19.8kg (add 0.8kg for fixing kit)
Impact Resistance Rating	IK09
Mounting Methods	Surface mounted

I-RANGE

SPECIFICATION

- ✓ LED colour temperature 3000K or 4000K (alternatives available)
- ✓ Colour rendering index >70
- ✓ Projected L90 after 100,000 hours
- ✓ Power factor >0.95 at full load
- ✓ Polyester powder coat finish in light grey, dark grey or a bespoke colour
- ✓ 511mm, 711mm and 1313mm housing lengths
- ✓ Lightweight low profile luminaire
- ✓ High quality marine grade aluminium
- ✓ PMMA lenses
- ✓ Toughened flat safety glass cover
- ✓ Variety of optics
- ✓ Optional remote IP66 junction box and NEMA 7 socket
- ✓ Dim level 8-100%
- ✓ DALI/1-10V options
- ✓ Integral control gear
- ✓ Pre-wired mains cable
- ✓ Silicone and PVC cable options
- ✓ Fixed clamp and adjustable stirrup clamp options

IP66
Ingress Protection

IK08
Impact Resistance

5-13kg Weight

Electrical Class I

-20 to 35°C Ambient

RANGE OVERVIEW

TYPE	IR-48	IR-64	IR-96	IR-192
System Power	67W	138W	214W	340W
Housing Length	511mm	511mm	711mm	1313mm
Asymmetric Optics	✓	✓	✓	✓
Symmetric Optics	✓	✓	✓	✓
Counterbeam Optics	✓	✓	✓	✓
CCT	3000K or 4000K			
Lumen Output	Up to 12,034lm	Up to 23,530lm	Up to 35,295lm	Up to 56,487lm
CRI	>70			

ELECTRICAL CHARACTERISTICS

TYPE	IR-48	IR-64	IR-96	IR-192
System Power	67W	138W	214W	340W
LED CCT	3000K or 4000K			
LED CRI	>70			
Lumen Output	Up to 12,034lm	Up to 23,530lm	Up to 35,295lm	Up to 56,487lm
Lumen Maintenance	Projected L90 after 100,000 hours			
Driver Current	450mA	700mA	700mA	700mA
Driver Output	Constant current output with AM dimming			
Power Factor (Full Load/Half Load)	0.95/0.90			
Operational Voltage	220-240VAC rms			
Operating Frequency	50/60Hz			
Driver Quantity per Luminaire	1	1	2	2
Inrush Current (Apk/50%-µS)	46A/250µS	53A/300µS	53A/300µS	53A/300µS
Running Current (Max)	280mA	580mA	890mA	1,420mA
Surge Protection (COM/DIF)	10kV/6kV Additional surge protection (on request)			
Dimming Protocols	DALI/1-10V			
Dim Level	12-100%	8-100%	8-100%	12-100%
Max. Driver Qty on MCB 16A Type C	11	8	8	8
Insulation Class	Class I (Luminaire)			
Connections	Luminaire complete with factory fitted silicone or PVC cable			

MECHANICAL CHARACTERISTICS

Housing Material	Extruded aluminium 6063T6 body with die-cast LM6 aluminium welded end caps	
Housing Finish	Chromate free pre-treatment, polyester powder coat, black (RAL9005)	
Cover Material	Toughened safety glass	
Lens Material	PMMA	
Clamp Material	Stainless steel 316	
Clamp Insulator Material	Nylon 11 coated	
Impact Protection Rating	IP66	
Weight	5kg (48 LED and 64 LED versions) 7kg (96 LED version) 13kg (192 LED version)	Add 1.4kg for fixing kit
Impact Resistance Rating	IK08	

ENVIRONMENTAL & SUSTAINABILITY CREDENTIAL

Being a subsidiary of the FW Thorpe Group, TRT Lighting is proud to be part of a forward-thinking establishment that prioritises environmental responsibility.

To demonstrate commitment to reducing the environmental impact of the Groups operations and products, all FW Thorpe companies are now bound into officially validated SBTi targets with robust data collection processes implemented to calculate our true, full carbon footprint.

All upstream and downstream activity is recorded to ensure that planning, targets and overall achievements fully align with the Paris Agreement 1.5°C targets.

FW Thorpe has therefore committed to:

42%
Reduce absolute Scope 1&2 emissions by 42% by 2030 from a 2021 base year on a market-based approach.

51.6%
Reduce Scope 3 emissions per £m revenue by 51.6% by 2030, from a 2021 base year.

90%
Reduce Scope 1,2&3 emissions by 90% by 2040 from a 2021 base year, in line with reaching net-zero with a maximum of 10% of emissions being offset.

In addition to having officially validated SBTi targets, over the course of 15 years the Group has designed and delivered an ambitious carbon offsetting scheme to help compensate for these emissions.

On 215 acres of owned land in Devauden, Monmouthshire, FW Thorpe Group plants enough trees to offset group emissions each year. 179,412 trees have been planted to date with a projected sequestration of over 44,385 tonnes of C02 over a 100-year period. The project has been designed and is managed by a silviculturist (an expert in the development and management of forests), fully backed and accredited by the FSC (Forest Stewardship Council). It also has the backing of the Natural Resources Wales and is the first site in Wales to gain approval with the Woodland Carbon Code, a voluntary standard for woodland creation projects in the UK to monitor and assess claims about the CO_2 sequestered.

Native broadleaf species maximise the potential of this site, and link adjoining ancient woodlands, improving the local environment. Sustainable forest management ensures that the trees thrive and are harvested at appropriate times to be used in wood-related products, meaning carbon is held within the wood well past the life of the tree.

Since 2012 TRT Lighting (and the wider FW Thorpe Plc Group) has been officially recognised as being carbon neutral with systems of reduction, measurement and certified offsetting in place. This decade long status has been independently assessed by a third party in accordance with ISO 14064, an international standard for the quantification and reporting of greenhouse gas (GHG) emissions and removals.

Company-wide initiatives such as energy use minimisation, self-generation of renewable energy through solar photovoltaic (PV) units, and procurement of renewable energy have reduced TRT's carbon footprint, whilst trees in its award-winning carbon offsetting afforestation project absorb the remaining carbon dioxide produced.

NET ZERO BY 2040

CARBON NEUTRAL SINCE 2012

MADE IN BRITAIN GREEN GROWTH PROGRAMME

MADE IN BRITAIN

MADE IN BRITAIN

TRT Lighting manufactures its luminaires in Redditch, Worcestershire and is a proud member of the official Made in Britain campaign and its Green Growth programme.

179,412
trees planted on 215 acres

TRT LIGHTING

TRT Lighting Ltd
Heming Point | Claybrook Drive | Washford Ind Est | Redditch | B98 0FH | United Kingdom
t +44 (0)1527 521162 **e** info@trtlighting.co.uk

www.trtlighting.co.uk